The National Weather Service of the 21st Century

The United States experiences more severe storms and flooding than any other country in the world. Annually, we can expect a staggering assault by the elements: some 10,000 violent thunderstorms; 5,000 floods; 1,000 tornados as well as several winter storms and hurricanes. By working with our partners, including TV meteorologists, emergency managers, and other government agencies, the National Weather Service (NWS) strives to meet the needs of the American public.

Extreme phenomena such as the Dust Bowl of the 1930s and the 1999 East Coast flooding from Hurricane Floyd affect our lives. Today, 90 percent of all presidentially declared disasters are weather- and flood-related. To protect life and property and to enhance the National economy, the NWS provides weather, water and climate data and forecasts and issues weather and flood related warnings.

Seconds can save lives, so weather forecasts and warnings must be as accurate and timely as possible. In addition, the effects of weather, water and climate events in one location often reverberate elsewhere. For example, drought in one region, can increase food prices in another.

In the 21st century, greater and faster computer power will allow the men and women of the NWS to extract critical weather information and predict natural hazards even faster and more accurately than they do today. We aim to be "America's No Surprise Weather Service" and are on the road toward that goal.

A Modernized Weather Service for the Millennium

In 1900, kite flying was the standard method for measuring "upper air" conditions and forecasts were little more than a summary of current conditions. Airplanes and weather balloons eventually gave us some better information and by the middle of the

century, early radars provided images of gray blobs to analyze. In the mid-1980s when we obtained national support to modernize our weather observing and forecasting tools, we were still using 1950s radars.

The NWS completed a $4.5 billion top-to-bottom modernization, one of the great government successes of the 20th century. We enter the new millennium operating the most advanced weather and flood warning and forecast system in the world with data from systems including satellites, Doppler radars, automated ground sensors, sophisticated computers and a network of new facilities across the country. Extensive training has helped make our employees become a world-class team of professionals.

The modernization effort is paying off and Americans will continue reaping its benefits in the 21st century. For example:

C Forecasters relied on data from the Doppler radar and weather satellites to issue warnings days before the Blizzard of 1996 dumped between eighteen and twenty four inches of snow on the northeastern U.S. The early warnings helped local governments brace for the impending event. In fact, the Virginia governor declared a state of emergency before the first snow flake fell.

C At the turn of the 20th century, tornado warnings were non-existent. Today, the average lead time for tornado warnings is 11 minutes, more than triple the three-minute average lead time 20 years earlier. In the next five years, our goal is to provide warnings on the average of 15-minutes in advance.

C For flash flood warnings, today's average lead time is roughly 51 minutes, a huge jump from the nearly 8 minute average in 1987. We project a 65-minute lead time for flash floods by 2005 and even longer lead times in the future.

For approximately $4 a person, per year, the NWS issues more than 734,000 weather forecasts and 850,000 river and flood forecasts, and between 45,000 and 50,000 potentially life-saving severe weather warnings annually. Today's three-to-four day forecast is as accurate as the two-day forecast was 15 years ago.

The 21st Century National Weather Service

During this century, the NWS will perfect a suite of weather, water and climate forecasts minutes to seasons to years in advance. Climate services, such as drought forecasts, issued months ahead will give communities time to prepare for extreme conditions. Forecasts supporting these products will assess the threat of particular hazardous conditions -- extreme heat, for example -- for specific regions weeks in advance. Precise forecasts of individual events, such as flash floods, issued hours and minutes in advance will provide individuals an opportunity to get out of harms way.

Laboratories operated by the National Oceanic and Atmospheric Administration (NOAA) our parent federal agency, conducted the basic research and helped develop many of the forecasting tools used today. Our forecasters will continue collaborating with NOAA researchers and the best minds in the fields of meteorology, hydrology and climatology to keep improving our services. For example, some of our are experimenting with new computer software to help forecasters quickly assess storm dynamics including strength and location for the next 30-60 minute period.

More data sources, powerful computer models, and three-dimensional imaging will push the boundaries of forecasting for years to come. Improved hurricane modeling will increase the accuracy of forecasting landfall for these dangerous events and will save dollars in unnecessary evacuation costs. In 1993, average landfall accuracy was 111 miles. By 2005, we will improve the accuracy of landfall predictions to 50 miles. Additional supercomputing power in the future will further refine the accuracy of these forecasts.

The NWS has successfully demonstrated an advanced river forecasting system that generates more accurate flood forecasts giving communities more time to prepare for these events. Implementing this system nationally will save lives and at least $200 million yearly in flood losses.

While technological advances are the foundation of tomorrow's warnings and forecasts, tried and true data gathering techniques including vital information from volunteer observers will continue to be essential to our operations.

Weather and You

Weather warnings mean nothing if you do not receive them or do not know what to do when severe weather strikes. We want warning systems, such as NOAA Weather Radio, to become as common in homes as smoke detectors. But warning systems are not enough. We will do our best to bring you the weather information that helps you plan your life. Today and tomorrow, you can help us by being weather-aware and weather-prepared.

To learn more about the National Weather Service, visit our Internet web site at http://www.nws.noaa.gov

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